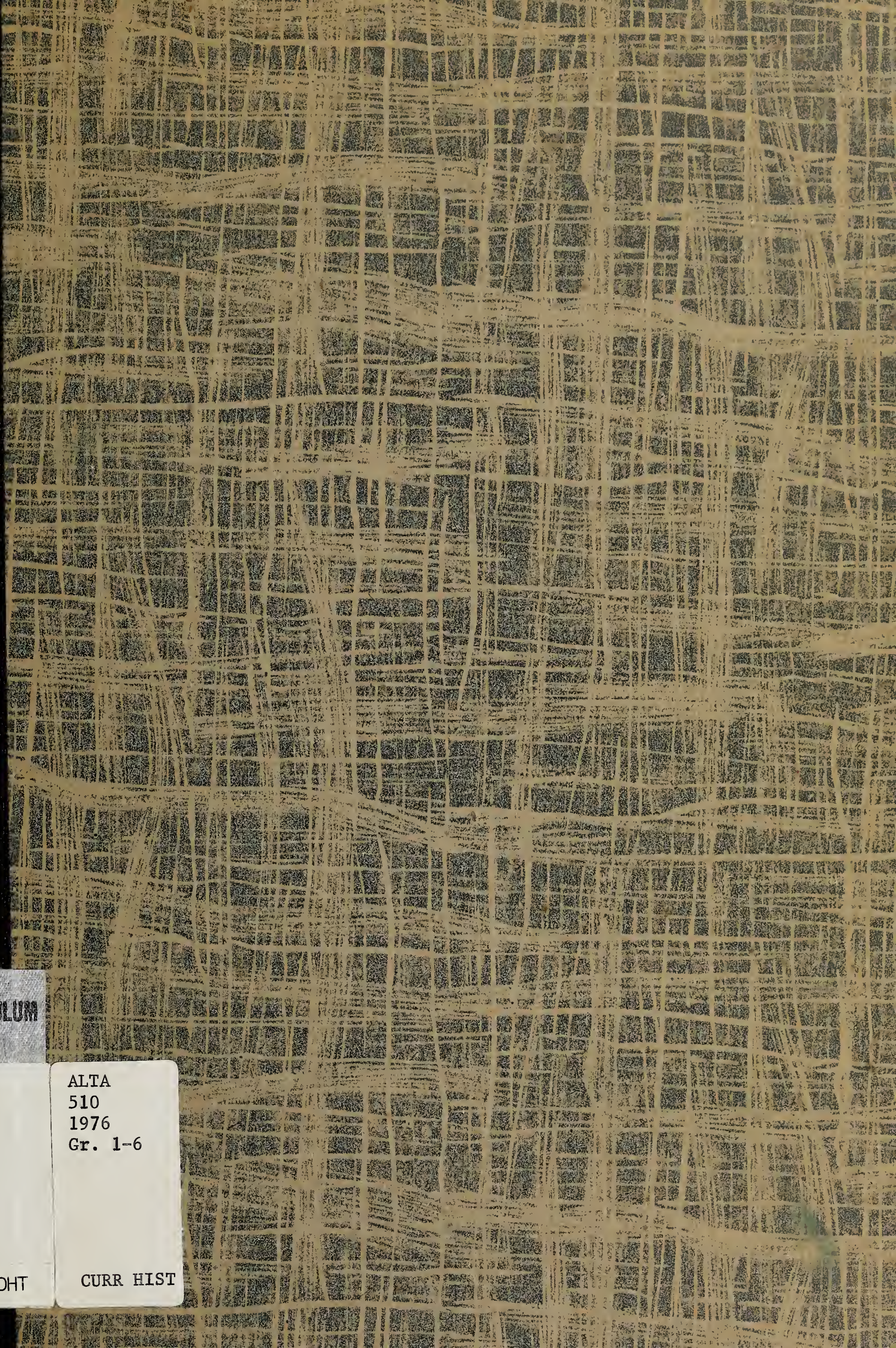

CURRICULUM

QA
14
C22
A3
A312
1976

CURRGDHT

ALTA
510
1976
Gr. 1-6

CURR HIST

Ex LIBRIS
UNIVERSITATIS
ALBERTÆNSIS

QUAECUMQUE VERA

RICAL
CTION

ALTA
510
1976
Gr1-

ELEMENTARY SCHOOL MATHEMATICS

TENTATIVE OUTLINE

June 1976

SUBJECT TO APPROVAL

of the

CURRICULUM POLICY BOARD

and the

MINISTER OF EDUCATION

ALBERTA EDUCATION
1976

UNIVERSITY LIBRARY
UNIVERSITY OF ALBERTA

THE GOALS OF ELEMENTARY SCHOOL MATHEMATICS

The goals of elementary school mathematics are to develop within the student the competency and willingness to deal with or interpret his environment.

1. by giving the individual the opportunity to discover order, pattern and relations which are the basis of mathematics found in the natural world and,

2. by giving the individual proficiency in skills necessary for daily living.

The general objectives of the elementary school mathematics program are of two related types, those dealing with the learner and those dealing with mathematical content.

A. 1. The program should foster within the learner:

    a. a sense of accomplishment and success with mathematics which should lead to positive self concepts and,

    b. a positive attitude towards mathematics.

B. 1. The program should provide the capacity to cope with the environment through development of process skills:

    a. Communicating - the receiving of mathematical data and expressing results in such a way that others now understand.

    b. Decision making - being able to define a problem, produce hypotheses about it and plan strategies to test these hypotheses.

    c. Organizing - the collection of information and sorting it into meaningful units which fit previous organizations and allow for the addition of future elements.

    d. Creating - starting with an idea and following it through to a product.

   2. The program should provide for the development of an understanding of numbers, operations and properties, measurement, geometry, and graphing through:

    a. Mathematical literacy -- receiving, understanding and using terms and symbols,

    b. Arithmetic skills -- recall of basic facts and the ability to compute,

    c. Application -- the ability to apply appropriate method and content to solve problems.

	Notes and Comments
NUMBER	
1. Matches members of two sets and determines equivalent and non-equivalent sets.	
2. Describes relationships such as more, fewer, greater than, less than, equal to. (no symbols)	
3. Associates a numeral with equivalent sets. (0-9) Cardinality.	
4. Demonstrates knowledge of order property of numbers by counting, arranging digits in order, and ordering sets by relative size. (0-9)	
5. Reads and writes numerals. (0-99)	
6. Identifies and renames the number of 10's and the number of 1's in any 2-digit number.	
OPERATIONS AND PROPERTIES	
1. Understands the process of addition and subtraction.	
2. Symbolizes addition and subtraction situations.	
3. Demonstrates mastery of the basic facts involving sums and minuends through 9.	
* 4. Sums and minuends to 15.	
MEASUREMENT	
1. Tells the time to hour.	
2. Recites the days of the week in order.	
3. Estimates and measures using non-standard units of capacity mass and linear measures.	

4. Compares two or more objects as shorter than, longer than, thinner than, thicker than, heavier than, lighter than, etc.	
5. Identifies instruments for measuring time, mass, length, capacity and temperature.	
6. Recognizes pennies, nickles, dimes and quarters, and the value of each.	
GEOMETRY	
1. Classifies, by manipulation, given 3-dimensional objects according to surfaces and shapes.	
2. Identifies by name 2-dimensional faces with application to objects in the students' environment.	
GRAPHING	
1. Collects data from immediate environment and constructs graphs using pictures or objects.	

LEVEL B (Grade 2)

	Notes and Comments
NUMBER	
1. Identifies the cardinal number associated with a set of objects.	
2. Orders numerals and recognizes "betweenness." (0-100)	
3. Reads, writes numerals. (0-999)	
4. Names ordinals first to tenth.	
5. Identifies the number of 100's, 10's and 1's in a given three-digit numeral.	
6. Identifies multiples by counting by 5's, 10's and 100's.	
7. Identifies and represents fractions $\frac{1}{2}$, $\frac{1}{4}$ (in a concrete setting).	
* 8. Rewrites any 3-digit numeral in expanded notation.	
OPERATIONS AND PROPERTIES	
1. Symbolizes addition and subtraction situations in either the horizontal or vertical form and solves for sums and minuends to 18.	
2. Understands the basis of the commutative property for addition.	
3. Understands the processes of multiplication and division.	
4. Demonstrates mastery of basic facts involving sums and minuends to 18.	
5. Solves picture and word problems. Estimates answers.	
6. Addition and subtraction algorithms to 99 with no regrouping.	
* 7. Symbolizes multiplication and division situations.	

MEASUREMENT	
1. Tells the time to hour, half hour, and quarter hour.	
2. Writes the hour, half hour and quarter hour using standard notation. (2:15)	
3. Reads the dates on the calendar.	
4. Recites months of the year in order.	
5. Estimates and uses standard units of length and capacity m, cm, ℓ, kg.	
6. Identifies proper measuring instrument for a given task.	
7. Reads the Celsius thermometer to 10 intervals.	
8. Counts collections of coins up to 25¢.	
9. Gives equivalent value of coins to 25¢.	
10. Makes purchases up to 25¢.	

GEOMETRY	
1. Classifies 3-dimensional objects and 2-dimensional figures in relation to corners, edges, and faces.	
2. Classifies 2-dimensional figures in relation to boundaries, corners and faces.	
3. Develops geometrical patterns from 3-dimensional objects and 2-dimensional figures.	
4. Using straws, pipecleaners, wire, geoboard constructs 2-dimensional figures.	

GRAPHING	
1. Constructs simple bar and pictographs from data collected from immediate environment.	
2. Locates position of an object on a 10 x 10 grid.	

	Notes and Comments
NUMBER	
1. Orders and determines "betweenness" of whole numbers (0-1000) and understands symbols >, < and = to show relationships.	
2. Identifies multiples by counting by 2's, 5's, 10's, 25's, 100's (0-1000).	
3. Reads and writes numerals. (0-9 999).	
4. Identifies the number of 1000's, 100's, 10's, 1's and tenths.	
5. Rewrites numbers in expanded notation form. (0-1 000) and vice versa.	
6. Identifies decimals to tenths.	
7. Identifies, writes and compares fractions from physical representation (halves, quarters, tenths, and fifths).	
8. Identifies odd and even numbers.	
OPERATIONS AND PROPERTIES	
1. Identifies additive, subtractive, multiplicative and divisive situations.	
2. Adds and subtracts two or three digit numbers with and without regrouping.	
3. Symbolizes multiplication and division situations.	
4. Identifies related sentences for addition, subtraction, multiplication and division.	
5. Understands the basis of the commutative property of addition and multiplication.	
6. Understands the unique effect of 0 and 1 in addition and multiplication respectively.	
7. Demonstrates mastery of basic facts involving sums, minuends, products and dividends to 18.	

8. Multiplies whole numbers by 10 and 100.	
9. Solves word problems. Estimates answers.	
* 10. Understands the basis of the associative property in addition.	
* 11. Generates problems.	
* 12. Understands the multiplication algorithm for one digit multipliers.	
MEASUREMENT	
1. Tells and writes the time to the nearest hour, half hour, quarter hour and five minute intervals.	
2. Knows the months of the year in order.	
3. Uses noon, midnight, a.m. and p.m.	
4. Counts collections of coins up to $1.00.	
5. Makes purchases and change up to $1.00.	
6. Reads Celsius thermometer to one degree intervals.	
7. Expands estimation and measurement to include the use of the standard units kg,km, dm.	
8. Uses standard instruments, (metre stick, litre container, mass scales, calendar, Celsius thermometer.)	
9. Expresses linear measurement to the nearest tenth of a unit (m, dm).	
GEOMETRY	
1. Classifies and identifies 2-dimensional figures and 3-dimensional objects.	
2. Constructs 2-dimensional figures using straws, pipecleaners, wires, geoboard, etc.	
3. Constructs 3-dimensional objects with Plasticine or modeling clay.	

GRAPHING	
1. Identifies the axis.	
2. Collects data and constructs simple bar, line and pictographs.	
3. Locates position of an object on a grid.	
4. Plots points on a grid when given the two co-ordinates.	

	Notes and Comments
NUMBER	
1. Identifies and uses place value of digits (0.01 - 99 000).	
2. Regroups 5-digit whole numbers and rewrites in expanded notation.	
3. Rounds off to a 3-digit whole number.	
4. Identifies, reads and writes a fraction to represent a point on a number line or a region with emphasis on halves, quarters, fifths and tenths.	
5. Identifies equivalence. Generates equivalent fractions for halves, quarters, fifths, tenths and hundredths.	
6. Interprets simple ratio situations.	
7. Reads and writes decimals to hundredths.	
8. Regroups tenths and hundredths.	
9. Expresses and generates proportional ratios.	
*10. Solves for missing numeral in a given set of proportional ratios without using cross-products.	
* 11. Reads and writes Roman numerals to twenty.	
* 12. Identifies factors and generates multiples of whole numbers.	
* 13. Identifies prime and composite numbers.	
* 14. Identifies odd and even numbers.	
OPERATIONS AND PROPERTIES	
1. Adds and subtracts numbers using the standard algorithm or expanded notation.	
2. Write related sentences for addition, subtraction, multiplication and division.	
3. Estimates in multiplication and division.	

4. Multiplies whole numbers by one and two digit numbers.	
5. Divides 1 and 2-digit whole numbers by a one digit divisor, with and without remainders.	
6. Demonstrates mastery of basic facts for sums and minuends to 18 and products and dividends through 81.	
7. Solves word problems. Estimates answers.	
8. Mentally multiplies whole numbers by 10, 100 and 1 000.	
9. Adds, subtracts decimals to hundredths.	
10. Understands the basis of associative property of addition and multiplication.	
MEASUREMENT	
1. Expands estimation and measurement to include the use of the standard units.	
2. Reads and writes time to minutes	
3. Expresses equivalent measures within units of capacity, mass, length and time. (e.g. 1 dm = 10 cm.)	
4. Finds perimeters of regular polygons without using formulae.	
5. Reads Celsius thermometer (familiarity with freezing and boiling points of water, body and environmental temperatures.)	
6. Finds area of rectangle without using formulae.	
7. Uses appropriate standardized measuring units as necessary.	
8. Uses money (coins and bills) for purchasing and making change.	
9. Expresses linear measure to nearest hundredth.	

* 9. Familiar with common metric prefixes: kilo hecto deca Basic Unit deci centi milli	
GEOMETRY	
1. Recognizes congruency of polygons.	
2. Identifies axis of symmetry in symmetric objects and figures.	
3. Identifies translations (slides), reflections (flip) and rotations (turns).	
* 4. Identifies and names points, lines, line segments and rays.	
GRAPHING	
1. Recognizes and reads bar, line, circle and pictographs.	
2. Constructs line, bar and pictographs.	
3. Writes co-ordinates as ordered pairs.	
4. Generates ordered pairs from a given relationship.	
* 5. Graphs ordered pairs from given relationships.	

	Notes and Comments
NUMBER	
1. Expresses tenths, hundredths, and thousands as fractions or decimals.	
2. Rounds given whole numbers to 5-digit accuracy.	
3. Reads and writes numerals and uses place value to order numerals. (0.001 - 999 999).	
4. Expresses and generates proportional ratios.	
5. Solves for the missing numeral in proportional ratios without using cross-products.	
6. Rounds to tenths and hundredths.	
7. Reads and writes Roman numerals to fifty.	
8. Determines lowest common multiple of two whole numbers and uses this concept to find common denominator of two fractions.	
9. Determines prime factors and H.C.F. of two numbers.	
OPERATIONS AND PROPERTIES	
1. Adds or subtracts any whole number.	
2. Multiplies whole numbers using the multiplication algorithm with one, two, or three digit multipliers.	
3. Divides whole numbers using the division algorithm involving one or two digit divisors with and without remainders.	
4. Estimates in multiplication and division.	
5. Demonstrates mastery of basic facts.	

6. Solves word problems. Estimates answers.	
7. Adds, subtracts, multiplies decimals to thousandths.	
* 8. Understands the distributive property.	
MEASUREMENT	
1. Extends use of standard units to include tonnes.	
2. Reads and writes time to seconds.	
3. Draws 2-D figures to scale using grid paper.	
4. Finds area of regular polygon without using formulae.	
5. Finds volume of rectangular solids without using formulae.	
6. Uses appropriate standardized measuring units as necessary.	
7. Students understand the system of metric prefixes, including use of symbols. kilo hecto deca Basic Unit deci centi milli	
8. Expresses equivalent measure within units of length, mass and capacity. e.g. 1 m + 4 dm + 2 cm = 1.42 m, 14.2 dm, 142 cm.	
9. Finds perimeters of polygons without using formulae.	
*10. Reads the 24 hour clock.	

GEOMETRY	
1. Tests congruency of polygons using motion geometry (slides, flips and turns).	
2. Names corresponding sides and angles of congruent polygons.	
3. Distinguishes 2-dimensional figures as similar or congruent.	
4. Identifies radius, diameter and circumference.	
5. Identifies intersecting, parallel and perpendicular lines.	
6. Compasses constructions.	
GRAPHING	
1. Interprets and solves problems from data collected from line, bar and pictographs.	
2. Constructs line, bar and pictographs.	
3. Reads and writes co-ordinates from a graph.	
4. Generates ordered pairs from a given relationship.	
5. Graphs ordered pairs from given relationships.	

	Notes and Comments
NUMBER	
1. Expresses halves, quarters and fifths as fractions or decimals.	
2. Rounds numerals to required accuracy to include thousandths.	
3. Expands decimal numerals using expanded notation.	
4. Identifies place value to billions (0.0001 — 1 000 000 000)	
5. Identifies and orders integers.	
6. Identifies applications of proportional ratios.	
7. Uses decimal fractions to express and solve for percent.	
* 8. Uses exponential notation and knows the meaning of base, exponent and power.	
* 9. Studies a numeration system with base other than ten.	
* 10. Studies a historical numeration system other than ten.	
* 11. Identifies odd and even, prime and composite, factor, multiple, LCM, HCF.	
* 12. Reads and writes Roman numerals.	
OPERATIONS AND PROPERTIES	
1. Adds or subtracts any whole number.	
2. Multiplies by a one, two, or three digit multiplier.	
3. Divides by a one, two or three digit divisor with or without remainders.	

4. Checks multiplication by division, and division by multiplication.	
5. Computes mentally simple addition, subtraction, multiplication and division problems.	
6. Multiplies and divides decimals.	
7. Demonstrates mastery of basic facts.	
8. Solves word problems. Estimates answers.	
9. Performs operations in non-decimal bases.	
MEASUREMENT	
1. Finds perimeters of polygons with and without formulae.	
2. Finds area of triangle and quadrilaterals using formulae.	
3. Finds volumes of rectangular solids using formulae.	
4. Reads distances according to a scale.	
5. Draws diagrams according to a scale.	
6. Recognizes interrelationships among units of length, capacity, and mass.	
7. Reads the 24 hour clock.	
8. Extends use of standard units to include are and hectare.	
9. Finds circumference of a circle.	
0. Uses similar triangles to measure inaccessible heights and distances.	
1. Finds area of a circle.	

GEOMETRY	
1. Identifies and names lines, line segments, rays, intersecting lines, parallel lines, perpendicular lines.	
2. Translates, rotates, reflects, and enlarges 2-Dimensional figures and objects.	
3. Constructs 3-dimensional objects.	
*4. Classifies polygons according to number of sides (pentagons, hexagon, heptagon, octagon, nonagon, decagon, dodecagon).	
*5. Identifies angles as obtuse, acute, right angle.	
*6. Identifies triangles as equilateral, isosceles or scalene.	
*7. Classifies triangles according to sides or angles.	
GRAPHING	
1. Locates points on all four quadrants.	
2. Generates ordered pairs from a given relationship involving integers.	
*3. Constructs circle graphs.	

Date Due

QA 14 C22 A3 A312 1976
ELEMENTARY SCHOOL MATHEMATICS
TENTATIVE OUTLINE JUNE 1976 --

NL 40041965 CURR HIST

000032207979

DATE DUE SLIP

F255